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# ROYAL ASIATIC SOCIETY.

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## PROCEEDINGS

OF THE

## COMMITTEE OF COMMERCE AND AGRICULTURE.

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*Chairman.*

COLONEL BARNEWALL.

*Committee.*

THE PRESIDENT, VICE PRESIDENTS, AND OFFICERS OF THE COUNCIL  
OF THE ROYAL ASIATIC SOCIETY.

RIGHT HON. HENRY ELLIS, F.R.S.	JOHN FORBES, ESQ.
HON. M. ELPHINSTONE,	JOHN FRASER, ESQ.
SIR C. FORBES, BART.,	COLONEL GALLOWAY,
SIR R. CAMPBELL, BART.,	J. HEATH, ESQ.,
HENRY BLANSHARD, ESQ.	DOCTOR HORSFIELD, F.R.S.
MAJOR-GEN. BRIGGS,	J. G. MALCOLMSON, ESQ., F.R.S.
JAMES ALEXANDER, ESQ.	COLONEL SYKES, F.R.S.
H. WILKINSON, ESQ.	G. COLQUHOUN, ESQ.
F. C. BROWN, ESQ.	G. G. DE H. LARPENT, ESQ.

*Treasurer.*

C. ELLIOTT, ESQ.

*Secretary.*

J. FORBES ROYLE, M.D., F.R.S., *Professor of Materia Medica, and  
Therapeutics, King's College.*

*Assistant, and Chemical Analyser,—E. SOLLY, jun., Esq.*



JUNE THE 1st, 1839.

A COMMITTEE was held this day at one o'clock. The Right Hon. HOLT MACKENZIE in the Chair.

An extract was read from the minutes of the Council of the Society, dated the 2nd of May, stating, that the Council had nominated the following gentlemen Members of the Committee for the ensuing year :

The Hon. Mountstuart Elphinstone, Colonel Galloway, Major-General Briggs, the Right. Hon. H. Ellis, Sir Charles Forbes, Bart., Josiah Heath, Esq., and F. C. Brown, Esq. The three first being Members of Council, and the latter elected out of the Society.

The Committee resolved to add to the list of Members of the Committee, nominated by the Council, the names of the following gentlemen : James Alexander, Esq., H. Blanshard, Esq., G. Colquhoun, Esq., Sir R. Campbell, John Forbes, Esq., J. Fraser, Esq., G. G. de H. Larpent, Esq., J. G. Malcolmson, Esq., Colonel Sykes, and H. Wilkinson, Esq.

The CHAIRMAN stated to the Committee, that in the course of the present year he intended to proceed to the Continent, and that he should, in consequence, be unable to continue to preside at the meetings of the Committee. He therefore moved that Colonel Barnewall be invited to take the chair for the ensuing year. This motion was seconded by Major-General Briggs, and unanimously carried.

A letter was read from J. STIKEMAN, Esq., Secretary to the London East India and China Association, to Mr. Solly, enclosing a list of nearly forty specimens of the productions of the Punjaub and Mysore, lately received from the Bombay Chamber of Commerce, and proposing to forward samples of any such as were new, or but little known, for examination and analysis.

A paper was read on the manufacture of paper, in the Province of Datee, by GEORGE TRAILL, Esq. Paper is manufactured in the Province of Datee, from the inner bark of the *Daphne cannabina*, or *Set Burroah*, a tree which abounds throughout the Himalaya Range. For this purpose the outer surface of the bark is scraped off, and the inner fibrous part is boiled in an alkaline lye made of oak ashes. The fibre is by this process bleached, and it is then washed and beat up into a pulp, and being again mixed with clean water, is spread upon moulds. These are usually made with fine bamboo matting ; but when large

sheets of paper are required, calico cloth is used in the frames. The paper prepared for the market is generally about a yard square, and is commonly of three different qualities, the finest sells at sixty-four sheets, the second at eighty sheets, and the third at one hundred and twenty sheets the rupee, in the Almorah market. This paper is remarkable for its toughness and durability, and moreover it is never attacked by insects, and it was, in consequence, recommended to the Bengal government for the manufacture of cartridges, but was found on trial to be too tough, as the soldiers were unable to tear off the ends with their teeth when loading. Mr. Traill presented a sheet of this paper measuring sixty feet by twenty-five, in which no joints were perceptible.

A Report by Mr. E. SOLLY on some sugar manufactured at Dindoree, under the superintendence of Dr. Gibson, was referred to the Society, and read at the General Meeting of the sixteenth of November. Mr. Solly observed, that since the year 1792, when the failure of supplies of sugar from other sources caused a great rise in the price of sugar, and, in consequence, drew the attention of the Government to the improvement of East Indian sugar, numerous attempts had been made to improve the manufacture of sugar in India. The detail of these experiments, and the degree of success which attended them, is well known from the voluminous Report published by the East India Company, in 1822. Notwithstanding all that was done, the cultivation of the cane and manufacture of sugar was far from satisfactory, and in consequence, the sugar was very far inferior to West Indian sugar. A comparison of prices shows the great difference in value between the two articles, and it was commonly considered that East Indian sugar was naturally bad, and must always be inferior to West Indian. During the last years, however, portions of sugar have come over from the East Indies of a very superior quality to the usual produce, and more approaching in character to the better sorts of West Indian sugar. The specimen from Dindoree, now under consideration, was prepared from the juice of the Mauritius or Otaheite cane; and it is stated in a Report of the Bombay Chamber of Commerce to be "the best sugar produced in the Bombay territories that has yet come before the Committee." And in another Report, the following experiments are detailed, showing the different quantities of sugar obtained from the native and Mauritius canes: "It may be interesting to mention that Dr. G. having tested definite quantities of Mauritius and native canes grown upon the same soil, found that twelve Mauritius canes, of good



quality, yielded an average of from fourteen to fifteen pukka seers of juice, equal to twenty-eight or thirty pints, while from the same number of country canes, also of good quality, four and three-quarters or five pukka seers, that is, from nine and a half to ten pints were obtained, showing a result in favour of the former of three to one. Again, as regards the saccharine matter extracted from the juice, the result of the experiment was still more satisfactory; fifteen pukka seers of Mauritius cane juice yielded from six to seven pounds of sugar and molasses, whilst five pukka seers of the country cane juice yielded about one pound and a half, being a difference of four to one in favour of the former. The process of manufacture was the simplest, the only apparatus used being such rude ones as could be procured in the villages." It is of a fine bright colour, and good strong grain. Its colour is rather against its use by the refiner, as the colour is far less easily separated than is the case with gray sugars; and, therefore, sugars of a yellow or honey colour will not make so good a loaf as gray sugar, although really of a lighter colour than the latter. The sugar from Dindoree was found to contain about sixty-nine per cent. of crystallizable sugar, and thirty-one per cent. of uncrystallizable sugar, exclusive of impurities. It is, however, more suited to the grocer than the refiner, from the reason just stated, and as the colour of the sugar in great measure depends on the process of manufacture, attention should be directed to its colour as well as to the grain. In conclusion, Mr. Solly stated, that he had showed a portion of the sugar to Mr. J. Travers, the wholesale grocer, who had favoured him with the following opinion: "The sample of East India sugar shown to us by Mr. Solly is hardly so sweet as West India sugar, but is of excellent grain, similar to good Jamaica sugar, and of desirable complexion for grocers. The lumps in it are rather objectionable. It would at present sell readily for 62s. per cwt. in the London market, including the duty of 24s., and will always command a ready sale.

" (Signed.)

JOSEPH TRAVERS & SONS."

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NOVEMBER THE 26th.

A COMMITTEE was held this day at one o'clock, Colonel BARNEWALL in the Chair.

A Report by the Agricultural and Horticultural Society of India, on the measures which have been taken with a view to improve the Cotton cultivation of India, was read and ordered to be printed. (See Appendix.)

Read a letter from Dr. SPRY, the Secretary of the Agricultural and Horticultural Society of India, enclosing a Report from a Committee of that Society, appointed to inquire into the most efficient method of obtaining the information respecting the prices of the most important Indian products which this Committee had applied for to the Court of Directors, (see p. 67,) and which application was referred by the Government of India to the Agricultural and Horticultural Society at Calcutta. The Committee appointed by that Society considered that the best method of obtaining the desired information would be through the assistance of the medical officers attached to the different stations, who, from their habits of industry and zeal in the cause of science, would be better able to procure the data required than either civil officers or the collectors of districts. They therefore recommended that the medical officers should be requested to undertake the inquiry, and collect and register the information they obtained.

Read a letter from Dr. LITTLE, of Bombay, the Secretary of the Agricultural and Horticultural Society of Western India, announcing the despatch of a series of samples to the Committee's address. These samples being already arrived were exhibited to the meeting. The following is a list of their names:—

Tawur Bark.	Butea Kino.
Kandeish Opium.	Senna from Tinnivelly seed.
Malwa Opium.	Do. from Country seed.
Cantharides.	Watery extract of Colocynth.
Native Aloes.	Do. do. Babool bark.

The Secretary stated that he was informed that upwards of 50,000 lbs. weight of Caoutchouc had recently been imported from Assam into this country.

A letter from Dr. C. LUSH, of the Bombay Establishment, was read, respecting the "Cumbi Gum," on which a paper had been read by Mr. E. Solly, at the meeting of the Society of the 20th of April last. (See p. 118.) Dr. Lush stated, that the resin in question was produced by the *Gardenia lucida* of Roxburgh, a beautiful shrub, occasionally cultivated in the gardens of the Deckan, and growing wild in the island of Elephanta, near Bombay. The resin exudes in transparent drops, or tears, from the extremities of the young shoots, and especially from the flower-buds. Dr. Lush also stated, in addition to the uses already mentioned, that it is employed in native medicine as



an antispasmodic, a few grains being administered to children attacked with convulsions during dentition.

Read a letter from JOHN CAPPER, Esq., of Ceylon, addressed to the Right Hon. Sir Alexander Johnston; accompanying a memoir on the most important commercial productions of Ceylon, and samples of the articles referred to.

Read a letter from THOMAS FRANKLAND, Esq., of Liverpool, to Mr. Solly, referring to the increasing demand for coffee, and recommending attention to its cultivation on an improved scale in India.

The following papers laid before the Committee were read at the Meetings of the Society of the 7th December and 15th February.

On Malwa and Kandeish opium, by Mr. E. SOLLY. Mr. Solly observed that the subject of Indian opium was one possessing peculiar interest at the present time, as the late news from China rendered it probable that a large quantity of Indian opium would shortly appear in the English market, in consequence of the prohibition, now so rigidly enforced, against its importation into the Chinese empire. In common with most other Indian drugs, opium has usually been considered very inferior to that obtained from other countries, and till lately it has been classed in medical books with the very lowest descriptions of opium. The fact, however, that the Chinese, who are by far the largest consumers of opium in the world, not only consider the Indian opium good, but even esteem it superior to Turkey or Smyrna opium, renders the examination of good specimens of Indian opium from different localities highly worthy of attention. The two samples of opium, sent over by Dr. Little, differ much in appearance and outward characters; both are in round flattened cakes, weighing about half a pound each. The Malwa is externally of a dark-brown colour, internally rather lighter, and having a greenish-brown tinge; when fresh, it was tough, but not difficult to cut, but after a short exposure to the air, it became much harder, and almost brittle. It has a strong opium smell, which, though somewhat peculiar, is not at all empyreumatic. The sample from Kandeish is much darker in colour, being nearly black, and much harder and more brittle than that from Malwa; when broken it presented a gritty or granular fracture; whilst the Malwa had a smooth and clay-like surface, containing occasional minute cavities, full of a pale yellow oil. One of the most remarkable characters of Indian opium is the large per-centage of soluble matter which it contains. The present specimens yielded 80

per cent. from the Malwa, and 72 per cent. from the Kandeish. This is, however, no proof of their value for medical purposes, although it probably is a recommendation to the Chinese, who, it is not unlikely, value that opium highest which yields the greatest quantity of *smokable extract*. The Malwa yielded about  $6\frac{1}{2}$  per cent., and the Kandeish 7 per cent. of morphia, the most important active principle of opium.

Mr. Solly concluded with the following sketch of the process of manufacture of opium adopted in Malwa, as detailed by Dr. Smyttan. The land selected for the cultivation of the poppy is usually in the immediate vicinity of the villages, both on account of the superior richness of the soil, the more abundant supply of water, and the greater facilities of cultivation and superintendence in such situations. The seed is sown broadcast, and the red, white, and variegated varieties are sown indiscriminately in the same field; but the Ryots prefer the purple variety, from the superior thickness and firmness of its capsules; the seed is sown in the latter part of December or beginning of January, and is generally cultivated as a second crop on land which has borne a crop of Indian corn. For the convenience of irrigation, the field is divided into small compartments or squares, and the whole is well watered two or three times before the plant springs, and five or six times during its progress to maturity. After the plants have attained the height of a few inches, they are carefully thinned at three successive periods, so that the mature plants stand at about three inches distant, whilst at the same time great attention is paid to weeding them and loosening the soil. In four months the capsules are sufficiently large to undergo puncture; an operation which is performed with a small trident-formed iron instrument, of three short prongs or blades, about the fourth of an inch separate. With this, three simultaneous vertical or longitudinal incisions are made in the capsules in the evening previous to collecting the juice. The most general mode is to divide the field into four portions, and each day all the ripe capsules in one portion are punctured, and in a second portion the juice collected of those capsules which were punctured the day before; the collecting the juice occupying the greater part of the day, until it is sufficiently late to commence the operation of puncturing. Thus in four days the juice is once collected from the whole field, and those plants which have undergone the operation are again ready for its repetition. A large capsule admits of this four times, the smaller ones only thrice. The milky exudation is scraped off the capsules by means of a blunt knife, about four inches in length and two and three-quarters in breadth, the blade of which is kept well oiled. After a



certain quantity of juice is collected on the edge, it is removed by the forefinger of the left hand to the back part of the blade; and thus the collector goes on, until he has got a considerable quantity; when he deposits it in a vessel, containing a small quantity of oil, which preserves the juice from change or evaporation; it is afterwards removed from the oil, some portion of which is however still retained. The juice is then stored in earthen pots, and kept till the end of October or November, when it is formed into cakes by being moulded and well mixed, and then allowed to dry in a large airy room, upon a layer of dried poppy-leaves, care being taken never to expose the cakes to the sun. Twenty seers of the juice yield about sixteen seers of the marketable drug. In the preparation of opium in Malwa, as thus described by Dr. Smyttan, it is evident that a large quantity of oil is introduced, which is stated to be linseed; it is, however, evidently not linseed, but some non-drying oil: its principal use is probably to preserve the juice from evaporation, and not, as has been stated, to increase its narcotic qualities.

Mr. E. SOLLY on the fibre obtained from the leaf of the pine-apple. Mr. Solly stated that in consequence of communications received from India, he had made inquiries respecting the probable value of the fibrous matter abundantly contained in the leaves of the ananas or pine-apple, which being very plentiful in several parts of India might be imported from thence in large quantities, and at no very great cost. The result of his inquiries amongst spinners generally was, that they did not consider the fibre as capable of being substituted for flax, in the manufacture of linen and similar textures, because the trials hitherto made with it had been unsuccessful. Mr. S. observed, that this was certainly no proof that the fibre could not be spun, but merely that the method at present employed in flax-spinning was not suitable to the pine-apple fibre; he had no doubt that it could be employed advantageously, either alone or in combination with other fibrous materials, and stated that a patent had been recently taken out by Mr. Zincke for the manufacture of thread from this fibre, and from the patentee's statement it appeared, that when the fibre is bleached, it becomes capable of being spun in the manner now adopted with flax, and by the same machinery, because the process of bleaching, by destroying the adhesion between the bundles of fibres, renders it much finer, and hence enables it to be extended between the rolls in the process of spinning. The patentee considers, that from its beautiful silky lustre, combined with considerable strength, it is well adapted to form

a substitute for linen. Mr. Solly thought that many other means might be found for effecting the object besides bleaching; he also suggested, as being worthy the attention of manufacturers, the possibility of the fibre being employed in the manufacture of paper, as its strength would perhaps be useful in combination with cotton and other tender materials, or in the manufacture of paper for particular purposes, when strength combined with lightness is a desideratum.

On a new and peculiar Indian gum resin, by Mr. E. Solly. The author had lately received a sample of an Indian gum resin, which had been sent from Bombay, under the denomination of *Gum galbanum*, but which, as it only resembles *Galbanum* in colour, was soon found to be a very different substance, and unsaleable. Mr. Solly was unable to make out the history of the gum resin, or the name of the tree from which it was obtained; it appeared to be a new and undescribed substance. The resinous part of it when separated from gum and impurities was a pale yellow colour, very transparent, and formed when spread upon wood a clear and brilliant varnish, which, from the resin itself being soft and ductile, was free from an objection common to many varnishes; namely, of being very brittle, and apt to split off when the varnished surface is struck with any hard substance. It therefore appeared probable that it might be used advantageously, mixed with some other resinous substance, in the manufacture of varnishes.

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#### MARCH THE 12th.

A COMMITTEE was held this day at two o'clock. Colonel BARNEWALL in the Chair.

R. HUNTER, Esq., and T. LAY, Esq., were introduced to the Meeting.

A letter was read from F. CHAPLIN, Esq., to Mr. Solly, on the use of the *Butea Kino*, as a substitute for Oak bark, and other astringent matters, in tanning leather. Mr. Chaplin, having made some careful trials of the tanning powers of this substance, considered that it substantially answers the purpose, but that the peculiar colour which it imparts to the leather is highly objectionable, and that leather tanned with it would be unsaleable, except at a considerable reduction of price. He feared, therefore, that it would hardly answer to import it from India, for the use of English tanners, as the freight and other expenses would necessarily add much to the cost of production or collection in that country. Mr. Solly observed, that although the red colour was



undoubtedly an objection, it was not perhaps in reality so great as might be supposed. It was probable that if the leather tanned with this substance was really as good as that made with other tanning materials, the prejudice against its peculiar colour would gradually subside; and he stated that catechu was now beginning to be used to a considerable extent in tanning, and that on its first introduction, the very same objections were made with regard to the colour which it communicated to leather, which were now made with respect to Butea kino.

Read a paper, by Dr. C. LUSH, on the cultivation of Pernambuco cotton in India. It was ordered to be printed in continuation of the other papers on cotton already printed by the Committee.

Read a Report on the principle productions of Ceylon, by J. CAPPER, Esq., of Columbo.

Mr. Capper confines himself entirely to the history of those articles which have for some time constituted the principal exports of the island. These are three in number, viz., cocoa-nut oil, cinnamon, and coffee, and mentions sugar, arrack, and the betel-nut, as articles which may probably at a future time become important as exports. Cocoa-nut oil, being the most advanced as a staple article of commerce, claims first attention. When the British took possession of Ceylon, this oil had long been known to the Cinghalese; but its manufacture remained in the hands of the natives, who continued to express it with a clumsy apparatus called a checkoo, and no attempt was made to improve the manufacture until the year 1819 or 1820, when Government at its own cost brought a small steam-engine and presses, with which they continued to make the oil until 1830; when, finding it a losing concern, they disposed of the machinery to some merchants. But although it failed in the hands of Government as a matter of revenue, it was still successful in the object for which it had been commenced, viz., the encouragement of its manufacture in the island, and its introduction into consumption at home. Its introduction into the London market, at the low rate of 20*l.* per ton, soon brought it into notice.

	£.		£. s.
In 1834 the value of cocoa-nut oil exported was	5,159	London price	33 0
1835       "       "       "	12,000	"	33 0
1836       "       "       "	15,700	"	34 0
1837       "       "       "	28,334	"	35 0
1838       "       "       "	16,652	"	36 8

Nearly the whole of the oil manufactured is exported to England, only about 1,000*l.* worth annually being exported to the continent of India and foreign states.



The whole of the island consumption is the manufacture of the natives, who also supply the merchants with small quantities for shipment. Many of these Wahnies, or native manufacturers, contract with merchants to supply them with oil at a fixed rate. This is usually thirty rix-dollars the leager of one hundred and fifty gallons, which pays them well, although their process is very slow, not yielding more than ten or twelve gallons a day. Their implements are very simple and cheap, consisting of a large wooden mortar and a pestle, revolving on a pivot, and turned by two bullocks. The nut is cut into small pieces, and placed in the mortar; and as the pestle revolves, the oil is expressed, and runs down into the lower part of the machine, whence it is taken up with cocoa-nut shells. The value of the manual labour may be set down as next to nothing, as the Wahnies employ their own families, which are generally pretty numerous; and the feeding of the bullocks is also but a trifling expense, as they live upon a little of the oil-cake and a few handfuls of grass daily. The number of these machines, or checkoos, in and about Columbo, may be estimated at sixty: each of these making ten gallons will give two tuns daily; but as probably not more than half of these are constantly at work, the average produce will be about six tuns weekly, of which half at least may be allowed as the consumption in the island itself.

There are at present two English houses manufacturing the oil, each having respectively eight and ten horse steam-engines, four pair of stones, and suitable hydraulic presses.

The trees from which the main supply of Copperah or dried nuts is obtained, are those growing along the coast from Columbo to Negombo and Calpentyne on the north, and towards Galle on the south. The tree abounds all round the island, but beyond these places the carriage of the article would be too expensive to repay the manufacturer. The whole number of trees in the island it is calculated would be sufficient to supply 62,000 tuns of oil annually; but it is not at all probable that all the trees will ever be retained for this purpose, because the toddy and arrack trade, although not so profitable as the oil, offer so ready a return of money, that the natives generally prefer it to the more lucrative but tedious trading in Copperah. The high price which the manufacturers of oil are enabled now to give the natives, is however rapidly increasing the number of trees set apart for the preparation of Copperah; the consequence of which will probably be a very considerable reduction of the price of that article.

*Cinnamon*.—There is perhaps no article in the world which has so

fully developed the evil tendency of the monopoly system as cinnamon; which, going home in its natural state, is loaded with a tax of 300 per cent. on exportation, and an additional cent. per cent. on its importation into England\*. From the first possession of the island by the English, the cultivation and selling of this spice remained in the hands of Government, as it had done under our Dutch predecessors, until the year 1833; when, to a certain extent, the trade was thrown open. The cinnamon then purchased of the natives by private traders, was obliged to be brought to the Government sorters to be sorted, and its quality certified. Large quantities of this cinnamon have been brought into the market, and by some it is considered very little, if at all, inferior to that belonging to Government; and it is usually purchased at 20 per cent. under the upset prices at the monthly sales. It appears, however, that during the last few years the same attention has not been paid to private cinnamon by the Government sorters; for complaints have been made at times of the quality of many bales, having official certificates attached to them, and several merchants have brought claims against the Ceylon Government for compensation for their alleged losses. This, combined with other circumstances, led to the late ordinance, which declared that after the 1st of November, 1838, Government would discontinue sorting and granting certificates of cinnamon for private dealers. They have, however, continued the fees paid for examination, although the examination itself has ceased. The parcels of cinnamon sent home by private traders, since the ordinance of 1838 came into operation, have certainly been in a much finer condition than any which ever came out of the Government sorting-house. It is a common idea in England that the superiority of Government over private cinnamon arises from the sorting; but this cannot be the case, for, as has already been said, until November, 1838, both were sorted and embaled by the same hands. The difference of quality depends really on the cultivation; that grown by the Government receives every possible attention, from the moment it appears as a young shoot until it is embaled in Her Majesty's store-houses; whilst that brought in by the natives is cut out of the wildest jungle from unfavourable situations, never having felt a knife until it is fit for baling. There are, however, some exceptions to this in the gardens of a few Europeans, who manage by careful pruning and cleaning to produce as fine quills of cinnamon as

\* The danger of this policy will be more apparent when it is remembered that cinnamon, equal in quality to our own, is cultivated in Java, and sent home under the great advantage of only a trifling export duty.



any from the Government plantations. Much of the inferior flavour of the private sort arises from the little care bestowed upon it after peeling and drying. It is collected throughout the country in small quantities from the poorer class of natives by the Modliars, or middlemen, and is by them brought down to Columbo for sale to the merchants. The very small quantities in which they receive it, (often as little as a pound at a time,) obliges them to keep it a long time in their houses before they get a cart-load, during which, it suffers considerably from smoke and damp, which impart a disagreeable flavour to the bark; the susceptibility of which to injury is as great as that of tea. The following statement shows the quantity of cinnamon delivered into the Government stores during the five years since the opening of the trade:—

	1834.	1835.	1836.	1837.	1838.	Total.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Delivered....	332,122	231,917	240,571	242,742	142,148	1,189,770
Rejected ....	47,783	113,861	58,315	84,841	38,901	343,701

Total..... lbs. 846,069

The average out-turn of a cwt. of private cinnamon by the Government sorters, was five pounds of the first quality, thirty pounds of the second, forty-one pounds of the third quality, and thirty-six pounds rejected. The out-turn by the present private sorters is not so favourable, owing to the greater strictness shown in classifying the sorts. The price of cinnamon is generally governed by the price of coffee; thus coffee being cheap and plentiful, remittances are made in that article, which is always preferred if at a fair price, and cinnamon falls for want of buyers, and *vice versâ*. Thus, during the three last months of 1838 it rose very high, owing to the dearness of coffee in the Ceylon market, which drove merchants to place their funds in cinnamon, and the consequent competition at the monthly sales drove up the price. Great dissatisfaction has been excited in Ceylon by the mode followed in effecting the sales of the Government cinnamon plantations, and in consequence there were few bidders at the sales. The great cause of objection was the clause which leaves Government the power of cancelling the sales made, if not at a satisfactory price; and in consequence hardly any of the gardens or plantations, which are five in number, and contain upwards of 12,000 acres, have been sold.



*Coffee.*—Until late years this article formed but an insignificant item of export, it being of an inferior quality, and fetching a very low price in England. The coffee of Ceylon was formerly a large flat white bean, covered with the parchment or skin, and very imperfectly dried: all consequent upon the careless mode pursued. The native never troubled himself with the pruning-knife; his object being *quantity*, with as little trouble as possible, without regard to quality. The robbery to which he was exposed from his neighbours, compelled him to gather his berries long before they were sufficiently ripened: and to this, as well as the thick foliage of the bushes on which they grew, is to be ascribed their white colour, and the adhesion of the skin. A year or two has however done wonders; for, witnessing the vast superiority of the European planters' coffee, they have begun to bestir themselves; and the consequence of this is, that their coffee is coming to market in a much better condition than formerly; so that whilst in 1838 Ceylon coffee was worth only 64*s.* to 68*s.* the cwt. in the English market, it rose in the three succeeding years more than 20*s.*, the cwt., being then from 86*s.* to 89*s.* per cwt. The following table exhibits the annual value of coffee exported from Ceylon during the last six years, and shows also how much of it was imported into Great Britain:—

To Great Britain.				India.				Other States.				Total.			
£. s. d.				£. s. d.				£. s. d.				£. s. d.			
1833	..	23,595	0 0	..	2,165	16 0	..	260	0 0	..	26,020	16 0			
1834	..	31,748	10 0	..	5,133	6 0	..	1,755	8 0	..	38,637	4 0			
1835	..	45,970	0 0	..	1,870	0 0	..	11,207	15 0	..	59,047	15 0			
1836	..	140,595	8 0	..	3,870	5 0	..	6,176	11 0	..	150,642	4 0			
1837	..	106,064	8 0	..	931	7 0	..	3	16 0	..	106,999	11 0			
1838	..	115,862	14 0	..	938	9 0	..	2	0 0	..	116,803	3 0			

In a few years it is probable that the latter amount will be doubled; for not only are many new plantations coming into bearing, but the value of the coffee is annually increasing. That the soil of Ceylon is suitable for the growth of the coffee-plant, there is no longer any doubt. Experiment has placed it beyond question; and several practical men from the West Indies, who have been upon most of the estates here, say that they have never seen trees looking more promising. Ceylon has certainly an advantage over the West India Islands in the cost of labour; for whilst the wages vary from 5*d.* to 20*d.* per day in Jamaica, in Ceylon, the coolies only receive from 3*d.* to 6*d.* per day; and likewise in the unlimited number of labourers which can at

all times be procured in Ceylon, whilst in the West India Islands there is always the greatest uncertainty in obtaining them. The mode of culture adopted in Ceylon varies much. Some hold that the plant thrives best in shaded,—others, in more exposed situations. In the vicinity of Kandy, where the soil is hot and coarse, although rich, it has been found expedient to plant, in the first instance, with a trifling shade, until the young tree has fairly taken root, and sent forth a sufficient foliage to screen its root from the direct rays of the sun. When that is the case, the sooner the shade is removed the better. An error into which many of the planters have fallen, is that of over-planting in proportion to their capabilities of superintendence; and when this is the case, the estate invariably is neglected. To ensure the well-working of the concern, every hundred acres should have a European superintendent; whilst there are at present several in the island of 400, 500, and even 600 acres, with only one European superintendent, and a Portuguese clerk as an assistant. The number of estates in Ceylon, in which coffee is cultivated, is rapidly increasing; so much so, indeed, that in one Government Gazette there were ten lots of land advertised, under the new regulations, as having been applied for, containing a total of 9,500 acres, or averaging 950 acres each.

*Sugar.*—This is yet a mere experimental article, its culture being quite in its infancy. It was first introduced into the island in 1836, by some gentlemen from the Mauritius, who purchased a tract of land near Galle, where they imagined the soil and position well adapted to their purpose. The result of two years' trial, and the sinking of a large sum of money, has however proved the contrary, and the estate is now almost in its original state of jungle. There is no doubt some similarity between the soil round Galle and that of the Isle of France; but it wants the substratum of clay and rock, which in the latter place retains so much of the moisture necessary for the cane during the dry season. More recently a tract of land has been planted in the vale of Dombera, near Kandy. The appearance of the canes, as well as a small quantity of sugar already made from some of them, would justify an opinion extremely favourable to the final result of the experiment. There are about two hundred acres planted, of which twenty acres are now fit for cutting. A small quantity of the canes was cut in the spring by way of trial, and the produce gave three tons of sugar to the acre, although they had not yet reached maturity. The island consumption of sugar is alone sufficient to encourage the undertaking, averaging 5,000 cwt. annually; but if the yield of the canes should



turn out anything like what is expected, it will give a good profit as an export to England, and be enabled to compete with the sugar both of the Mauritius and of the West Indies.

Mr. E. SOLLY stated, that having shewn the specimens of sugar and coffee, which accompanied Mr. Capper's report, to highly competent judges, he had been favoured with the following opinions:—

*Kondesalle Coffee.*

"The undersigned having carefully examined and tasted a sample of coffee marked Kondesalle, pronounce it sound and good, partaking much of the character of low middling Jamaica, both in appearance and flavour; and would realize at the present time in the London market 108s. to 110s. per cwt. in bond. As Ceylon coffee we consider the quality to be fine.

(Signed)

" W<sup>M</sup>. BROOKE.  
J. E. MARKLAND.  
R. HABBERFIELD."

" *London, December 12, 1839.*

*Dombera Sugar.*

"The sugar, of which a sample is exhibited to us by Mr. Solly, marked from the Vale of Dombera, near Kandy, would at this time readily sell in any quantity in the London market for 24s. or 26s. per cwt., exclusive of the duty, (24s.) if wanted for home consumption purposes. Sugars of the same quality were imported from the interior of the East Indies during the year 1838, in considerable quantity, and were used freely and profitably by the London refiners. We believe, therefore, that there will be a certain sale for the sugar; and, judging from our experience of all other sugars both from the East and West Indies, we have no doubt that, with proper care in the cultivation and curing, the quality will year by year improve rapidly, which will open the door to competition on the part of our other principal consumers, the grocers, for whom the quality of the present sample is hardly good enough.

(Signed)

" JOSEPH TRAVERS and Sons."

" *London, December 18, 1839.*"

Read a letter from MAJOR-GENERAL BRIGGS, on the subject of Cocoa-nut oil. After referring to the great loss frequently experienced from the leakage of cocoa-nut oil, and the great difficulty consequently attendant on its importation, General Briggs wished to draw the attention of the Committee to an accompanying account of a new mode of securing the casks, invented by Mr. Huxham, and which is stated entirely to prevent the loss from leakage. The following is an extract from Mr. Huxham's letter.



“The hoops of the cask are to be driven on very tight; it is then to be filled (within eight inches of the bung) with oil, and exposed to the action of the sun’s rays (in a tropical climate, sometimes 160° Fahrenheit,) for twenty days or more, as may be necessary, taking care that on the first appearance of leakage the cask be placed on its end, and the hoops again drove. This may be repeated until the cask is made perfectly tight, when it is to be filled up for the shipment. The nature of the oil and the heat will cause the staves to shrink very much during the first ten days.”

The CHAIRMAN said, that he understood a wood had lately been discovered of which casks for the importation of cocoa-nut oil were now made which did not leak at all, and thereby iron cisterns and other contrivances were rendered quite unnecessary.

A letter was read from Mr. STIKEMAN, the Secretary of the London East India and China Association, to Mr. Solly, requesting to know what quantity of soil would be required for chemical examination, as he was about to ask the assistance of Government in procuring samples of West India sugar soils for chemical analysis by Mr. Piddington of Calcutta.

Read a letter from Mr. GORDON, Chairman of the Bombay Chamber of Commerce, to Mr. Solly, returning thanks for his report on oils, and expressing satisfaction at the results detailed in it, and stating the hopes of the Chamber of being enabled to carry out Mr. Solly’s suggestion of sending over to this country a larger portion of each of the oils he had examined, that their uses might be fairly tested on a manufacturing scale.

Read a paper by COLONEL SYKES on the introduction of the *Morus multicaulis* into India. The author drew attention to the important fact, that the *Morus multicaulis*, a variety of mulberry, indigenous to China and the Philippine Islands, was unknown in India, and that silk-worms fed on the leaves of this plant, produced better silk than those fed on the leaves of the common plants, whilst the shrub is otherwise highly valuable from its hardiness, and the facility with which it is propagated. In illustration of these points, Colonel Sykes gave several extracts from a book lately published in Philadelphia, by John D’Homergue, who gives the following summary of the peculiarities and advantages of this plant:—

“1st. It has been ascertained, That the *Morus multicaulis* does not require any particular soil as exclusively suited to its growth, but prospers even in a wet soil, which it seems to prefer.

“2nd. That it yields very little fruit, so that the leaves are more easily cleaned, and less matter of a fermenting nature is introduced into the body of the silkworm.

“3rd. That it does not rise too high, and yields a greater quantity of leaves, which can easily be gathered by women or children.

“4th. That it puts forth its thin, tender, and soft leaves earlier than other mulberries, which permits the period of hatching the silk-worms to be anticipated a few days.

“5th. That the roots possess the remarkable property of throwing up numerous small flexible stalks, without forming properly a principal trunk.

“6th. That these stalks assume in a very short time a great length.

“7th. That the leaves speedily acquire a remarkable development, and are promptly renewed.

“8th. That these stalks or branches strike root as cuttings with extraordinary facility without particular care, even before they have acquired a ligneous or woody consistence.”

A report by Mr. E. SOLLY, on the collection of drugs sent over by the Bombay Chamber of Commerce to the London East India and China Association, was read at the Society's meetings of the 15th of February and 7th of March.

Amongst the extensive series of samples sent, some few are well-known articles of commerce, and therefore, of course, need no description; a few are medicinal substances, which should be submitted to actual trial, in hospitals or elsewhere, where the greatest facility exists for practically testing their medicinal virtues. But in order that this may be done effectually, it is essential that all samples sent for such examination, be accompanied with complete and accurate information, as to the purpose to which they were applied, and the diseases for which they are considered specifics in India: and it is much to be regretted that more care is not bestowed on labelling properly all specimens sent from India, as from the careless mode in which they are frequently labelled, a good deal of trouble and confusion often arises. In the following short account of some of the most important of this series of specimens, to the description of each is prefixed the letters or marks by which they were distinguished:—

*Samples from the Punjab.*

P.A. *Lodar Bark*, or *Lodh*. (The bark of *Symplocas racemosa*?)  
Used for dyeing cotton; for taking a red colour from Munjeet.



Probably the Lodu bark described by Dr. Buchanan Hamilton. It yields an astringent brown-coloured solution, and may be employed alone as a dye-stuff; forming various shades of brown, grey, and chocolate. Its use in dyeing red, as practised in India, is probably merely as an astringent, and similar in its action to the bath of galls employed in this country in the dyeing of Turkey red.

P.B. *Munjit*. The root of *Rubia Munjista*. This dye-stuff is well known to dyers; but it has not nearly so good a reputation as it appears deserve, as exceedingly good colours may be dyed with it by proper management; though it is usually considered as very far inferior to madder, and only suitable for the commonest kinds of dyeing. It has long been under a considerable disadvantage in being subjected to the same duty as madder; and, as it contains less colour than that dye-stuff, it has, of course, been proportionably higher taxed.

P.D. *Kossumba*, or *Safflower*. The samples of this dye are of inferior quality, and worth in consequence only about 8s. per cwt.

P.E. *Maen*, or *Sacklur*. A berry used for mixing with cochineal to heighten the colour. This, though called a berry, has more the appearance of being an exudation formed on the young leaves or buds of some tree by an insect, and similar in nature to the gall-nut. It is perhaps the gall of the Tamarisk. It forms a pale greenish-coloured solution in water, which is very astringent and slightly acid; when added to a solution of cochineal, it precipitates the animal matter and acts as a feeble acid, the solution becoming in consequence slightly darker and clearer. The quantity of astringent matter contained is very large, and hence this substance would, if not too expensive or difficult of collection, form a very good substitute for galls for many purposes in the arts where galls are now employed. It dyes a good black with iron mordants, and makes excellent writing ink. Its most important constituents are tannin, gallic acid, and colouring matter.

P.J. *Hurda*. The dried fruit of a species of *Terminalia*, called *Myrobolans*, and used in India in dyeing yellow, and in tanning. They contain a large proportion of tannin associated with gallic acid, gum, and a yellow colouring matter. Although very little known to British dyers, they are by no means new, having been introduced a considerable time ago by the Society of Arts; they do not, however, seem to have much attracted the attention of manufacturers. With iron mordants they form durable and very beautiful black dyes. The greatest drawback to their use is the comparatively large quantity of useless matter which they contain, as the stone which occupies a large portion of the centre of the fruit, and constitutes a great part of its weight, is wholly



useless, and contains neither colouring nor astringent matters. The yellow colours dyed with it are tolerably good, but not desirable.

P.K. *Ukulbere*. A bark used for dyeing silk yellow. It contains a very bitter yellow colouring matter, probably analogous to the bitter principle of Quassia. As a dye-stuff it does not appear likely to be useful; but its bitter principle might probably render it of value in medicine.

P.L. *Sea Halelar*. Probably black Myrobolans, greatly resembling the fruit of the Terminalia in character and composition, like it containing tannin, gallic acid, gum, extractin, and a yellow colouring matter; but less astringent, and containing more acid than the Hurda.

P.N. Small dark-coloured seeds, similar in appearance to carraway, and yielding like them an aromatic volatile oil.

P.P. *Sajeekhar*, or *Alcali*. The sample so labelled, is in fact nothing but common salt, of very good quality, being native, or rock salt; and not a manufactured variety.

P.R. *Lac*. Of poor quality.

P.T. *Toondana*. A yellow dye. The flowers of Cedrela toona; they contain a yellow colouring matter, and have a very agreeable odour, resembling fresh honey. They would probably yield a volatile oil on distillation with water. The colours dyed with it are pretty; but apparently not very durable. It would be worth while to examine the bark of the tree yielding these flowers, as it is stated by Dr. Roxburgh to be powerfully astringent.

P.U. and V. *Indigo*. Of very inferior quality; so much so, as at first to render it almost doubtful whether they are really indigo. They contain a very large per centage of earthly impurities, so that it is evident that they have been purposely adulterated. They yielded, on analysis, between 60 and 70 per cent. of earthly matters, and a very large quantity of resin, probably occasioned by imperfection or carelessness in the manufacture. They would be worth from 1s. to 1s. 6d. per lb.

P.W. *Borax*. The specimen thus labelled is, merely, common sal ammonia.

#### *Samples from Mysore.*

M.B. and M.C. *Linseed*. Rather unfavourable samples, the seed being slightly decayed and a good deal mixed up with dirt and impurities; they yielded an average of about 29 per cent. of oil.

M.D. Seed of Carthamus tinctoria, or Safflower. This seed yields the oil called Kossumba and which has before been adverted to as being one of the series of twelve received from Bombay, (see p. 94.)

It is almost unknown in this country, and promises to be of value when better known to oil consumers and merchants.

M.E. *Cassia Lignea*. Of inferior quality.

M.F. *Turmeric*. Slightly decayed, but otherwise of good quality.

M.H. *Maddi Chikha*. The bark of a species of *Morinda*, probably of that species, the roots of which constitute the Indian dye-stuff, called Muddi. It contains two colouring matters, one red, and soluble in spirit, and the other yellow and insoluble. Alkalies render the colour crimson, and acids change it to green. The colours dyed with it were all dingy, but some useful stone and brown colours were obtained, which promised well, and it consequently appears worthy of further trials: the more so as it could most probably be obtained at a very low cost in India.

M.I. *Capilla Ringhill*. The powder rubbed off the dried fruit of the *Rottlera tinctoria*. It is used by the natives to give to silk a pale orange yellow. Its colouring matter is of a resinous nature, and soluble in spirit, and alkaline solutions, being precipitated from the former on dilution with water, and from the latter by the addition of acids. The native dyers of India being aware of this, avail themselves of the solvent power of carbonate of soda. The colours obtained from this dye are pretty, but not very fixed, and they would probably be expensive. It might possibly be used in the manufacture of coloured lacquers.

— M.J. *Rala Dammer*. A resin, obtained from the *Vateria Indica*. It is used in India, in the preparation of certain varnishes and compositions, and is a resin similar in nature to copal, and but little known in this country. It is very well adapted to the manufacture of varnishes, being soluble in the same liquids as copal, and forming a very brilliant hard varnish when applied to wood or other surfaces. The specimen is, however, rather impure, and the colour not very good. It should be carefully collected and sorted as to purity and colour.

M.K. *Dupa*. A resin, supposed to be obtained from the *Chloroxylon dupa*; it, however, does not seem to correspond with the accounts given of that resin, and is therefore most probably not the produce of the *Chloroxylon*, but, perhaps, of some similar tree. The specimen is not very well defined in its characters, being very much adulterated with impurities. Portions separated from adhering matters had many of the characters of copal, being but little acted on by spirit, and soluble in ether or oil of turpentine; only a small quantity of a tough elastic matter being left, similar to that which remains on dissolving copal. If this resin could be procured in larger pieces, and less con-



taminated with bark and impurities, it would be a useful material for varnishes, &c.

M.M. *Dhupada Jennie*. The vegetable tallow of the *Vateria Indica*. A substance of much interest, and highly deserving attention. There seems good reason to expect that it might be procured in India in large quantity and at a low rate, as the tree from which it is procured grows easily, and yields it abundantly. There is hardly any doubt that it would prove a valuable addition to the fatty substances now employed in the arts. Its use in the manufacture of candles is almost self-evident, and there are several other uses to which it is very applicable, so that it only requires to be well introduced to ensure a sale. (See p. 114.)

M.Q. *Poppli Chickha*. A red dye wood, with which good red and purple colours may be obtained. Dr. Buchanan states that it is probably the wood of a species of *ventilago*, and is very common and plentiful in certain districts. It seems to be wholly unknown in this country, and appears worthy of further trials.

In conclusion, Mr. Solly states, that of the whole series, only eight appear little known to manufacturers, and likely to become useful articles of import; these are Lodar bark, Maen, Myrobolans, Maddi, and Poppli chickha, the resins of the Dupa and Peynie marum, and the vegetable tallow; the remainder are all either well known or little likely to become imports.

APRIL THE 29TH, 1840.

A COMMITTEE was held this day at four o'clock. COLONEL BARNEWALL in the Chair.

The CHAIRMAN stated to the Committee that he had sent copies of the proceedings of the Committee to Lord Ellenborough, the Chairman of the Committee of the House of Lords, and to Lord Seymour, the Chairman of the Committee of the House of Commons, now sitting for the inquiry into the trade of India, and read a letter received from Lord Seymour returning thanks for the same.

Read a letter from JOHN SULLIVAN, Esq., Member of the Madras Council, on the cultivation of the tea plant in the Neilgherries. He states that though from long neglect the plant was nearly lost in that region, it was in June, 1839, growing in such a state of luxuriance as to leave no doubt that if extensively propagated, the manufacture of tea might be carried on with great success, perhaps even greater than in Assam. Mr. Sullivan enclosed a memorandum of M. Perrottet, an

experienced naturalist, in the service of the French government, respecting the state of the plants at Kaitz when he left the Neilgherries in October, 1838, describing them as being covered with leaves, flowers, and fruit, the plants being mostly about four feet high, and in a most prosperous condition. Mr. Sullivan states that the tea-plant is also growing in great luxuriance at higher elevations than Kaitz. Much of the seed obtained from these plants appear to be worthless, but this he believes is always the case, as the Chinese are stated to put two handfuls of seed into a hole four fingers deep and eight inches in diameter, and that not more than ten or twenty germinate. Mr. Sullivan also encloses letters relating to the cultivation of tea, from Captain Robertson, who had lately visited the tea plantation in Wynaad, and who states that though it had been very much neglected, and the plants destroyed by cattle, he saw one which was in a very flourishing condition and bearing ripe seeds; and another from Captain Le Hardy, the Superintendent of Coory, from which it would appear that the plants which were transferred from the plantation in Wynaad withered away on their arrival, apparently from the attacks of a small kind of grub, which was found about the roots of all that died. In conclusion, Mr. Sullivan observes that the coffee-plant which was introduced into Wynaad a few years ago, is growing in great abundance in the neighbourhood of Manatoddy. The annual produce is stated to be about forty maunds, and as the Ryots have begun to form plantations, a large increase will soon be made in it.

Mr. E. SOLLY read a short paper on Assam caoutchouc. He stated that the Assam caoutchouc was very various in quality, two very different kinds being imported under that name: the best sort being mostly in round white balls, of a fibrous, silky texture, and containing small pieces of wood, and other vegetable impurities. The rubber itself, however, is good and strong, and considered by manufacturers to be equal to any known. The other kind of rubber brought from Assam is of a black colour, in the form of cakes or flattened masses, and is very soft, having little or no elasticity, and does not seem to increase in strength by age. The difference in value between these two kinds is of course very great, because, though the latter kind can be used for some purposes, such as forming waterproof varnishes, the manufacture of Mackintosh cloth, distillation, &c.; yet for all purposes where the tenacious and elastic qualities of rubber are required, it is of course quite useless. He observed that it would be very desirable to ascertain from what place the white strong fibrous-looking rubber was procured, from what tree it was obtained, and how it was pre-



pared. It was precisely similar in properties and appearance to the first samples of Assam caoutchouc sent over as being obtained from the *Ficus elastica*, whilst the black and unelastic caoutchouc was totally different, and had much the appearance of having been injured by heat in drying.

Extracts were then read from various recent Indian reports on sugar, silk, &c.

Great interest is excited in India by the very successful results attending the introduction of the Otaheite or mountain cane. Great pains have been taken, throughout the Bombay Presidency, to extend and improve the growth of this cane, and to encourage the manufacture of improved sugar. The cultivation of the sugar-cane was much benefited by the alteration effected in the assessment of irrigated lands in 1839; it was in consequence greatly extended, and a larger revenue was obtained from it. The judicious experiments of Dr. Gibson in the Poonah district, in 1837-8, convinced the natives of the superiority of the Mauritius cane, and likewise proved the suitableness of the soil and climate of the Deccan for its cultivation. The Bombay authorities have lately requested that proper machinery should be sent from England to enable Dr. Gibson to carry out his experiments more completely. The home government, however, thinking that the manufacture of sugar should be left to individual enterprise, declined sending out machinery. In consequence of this resolution, it becomes desirable that individuals possessed of the requisite skill and capital should be acquainted that so wide and promising a field of enterprise is open to them.

Much attention has also been devoted for a long series of years to the cultivation of silk in the Deccan, and the present prospects are highly satisfactory. The local authorities about the year 1825 introduced the Bengal field-mulberry, which is cultivated as a shrub, and requires constant irrigation; but as this is very expensive, and as the monsoons are extremely uncertain, but little progress was made in its cultivation. In 1830, new varieties of mulberry were introduced by order of the Court of Directors, and amongst these was the St. Helena mulberry, which bid fair to answer every expectation. In the close of 1830, M. Mutti arrived at Bombay, and recommended the introduction of the standard instead of the bush or shrub cultivation. The late Sir John Malcolm held out encouragement to M. Mutti, and granted him lands in the vicinity of Poonah, and assisted him with a loan of 6000 rupees, for which Sorabjee R. Patell, as well as M. Mutti and his partner, became securities. Differences, however, arose between

them, which terminated in the transfer of the whole of the gardens to the Patell. Subsequently, in the year 1830, M. Mutti visited the gardens, by order of Government, and found the mulberry shrubs were in a very unproductive state, and that in several of the gardens they had been removed, and replaced by ordinary fruit-trees. It would appear that the dissolution of partnership arose from difference of opinion as to the most proper modes of cultivating the mulberry, M. Mutti being in favour of the standard cultivation, as in the end by far the best mode, whilst the Patell considered the bush or shrub cultivation preferable, because by adopting that mode of treatment, more immediate profits could be realized, and in consequence, the shrubs were, after three years, in the state M. Mutti found them. During this interval, M. Mutti had not given up his project, but had continued, though on a small scale, to rear worms and manufacture silk from their cocoons; and in the year 1838, after struggling for years with opposition and difficulties that would have been insupportable to a man of less energy and determination, he had the satisfaction to see his system adopted even by those who had previously been its most strenuous opponents; and Drs. Wallich, Graham, and Lush, after long objecting to his system of cultivation, bore honourable testimony to its merits; and the Agricultural Society of India marked their sense of his services by voting him a gold medal for having introduced the standard mulberry into the Deckan, and thus very greatly benefited the cultivator of silk, both in respect of quality and cheapness. In 1838, the Government of India appropriated the sum of 53,000 rs. to be expended during the four succeeding years in promoting the cultivation of the mulberry-tree, and in training the natives in the art of rearing the worms, and preparing and winding the silk; and M. Mutti is now employed under the Bombay Government as superintendent of silk culture: and since his appointment, rapid progress has been made in forwarding the objects in view. The Agricultural and Horticultural Society of Calcutta report that the silk prepared by M. Mutti in the Deckan is of very superior quality, and that it was sold at 16 rs. per seer, being 2 rs. more than the best China silk was selling for. This price M. Mutti calculated left a profit of 11 rs. per seer, as he can under the tree cultivation produce the silk at 5 rs. per seer.

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**APPENDIX.**

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**PAPERS ON COTTON.**





## CONTENTS.

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- I. On the Past and Present Condition of the Cotton Trade of India,  
by MAJOR-GENERAL BRIGGS.
- II. On the Introduction of Pernambuco Cotton into India, by  
C. LUSH, M.D.
- III. Report of the Cotton Committee of the Agricultural and Horticultural Society of India.
- IV. India Revenue Letter on Cotton, of the 15th of March, 1839.
- V. Minute by the Governor-General of India on the Improvement  
of Indian Cotton, of the 14th of August, 1839.

